U.S. NAVY NORTHERN DIVISION
REMEDIAL ACTION CONTRACT
CONTRACT NO. N62472-94-D-0398
DELIVERY ORDER NO. 0006

SAMPLING AND ANALYSIS REPORT FOR SITE 13 GROUNDWATER MONITORING ROUND 2

NAVAL CONSTRUCTION BATTALION CENTER (NCBC)
DAVISVILLE, RHODE ISLAND

April 1997

Prepared by

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Revision	Date	Prepared By	Approved By	Pages Affected
0	04/18/96	D. Peterson	L. Kahrs	All

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ACRONYMS

CBC	Construction Battalion Center
CED	Construction Equipment Division
COC	Chain of Custody
CRC	Contamination Reduction Corridor
EPA	Environmental Protection Agency
MS/MSD	Matrix Spike/Matrix Spike Duplicate
NCBC	Naval Construction Battalion Center
NORTHDIV	U.S. Navy Northern Division
QA	Quality Assurance
QC	Quality Control
RAC	Remedial Action Contract
SAP	Sampling and Analysis Plan
mg/L	parts per million (ppm)
ug/L	parts per billion (ppb)

1.0 PROJECT DESCRIPTION

1.1 Introduction

Foster Wheeler Environmental Corporation (Foster Wheeler) has prepared this Sampling and Analysis Report for Delivery Order No. 0006 under the U.S. Navy Northern Division Remedial Action Contract (RAC) N62472-94-D-0398. This report covers round 2 of the groundwater monitoring that was performed at Site 13 located at the Naval Construction Battalion Center (NCBC) in Davisville, Rhode Island. The round 1 sampling and analysis results are included in Foster Wheeler's *Draft Contractor's Close-out Report for the Time Critical Removal Action at Site 13* issued in March 1997.

1.2 Background

Site 13 consists of approximately six acres located in and surrounded by the Naval Construction Battalion Center (NCBC) in Davisville, RI. The site, located north of Buildings W-3 and W-4 and northwest of the former location of Building T-1, is bounded on the south by "A" street, on the east by Exeter Street, and on the north by Foster Road.

From 1945 to 1955, the Construction Equipment Division (CED) was housed in Buildings W-3, W-4, and T-1. Overhaul and repair of construction equipment were conducted in these buildings. Drums of oils, thinners, and solvents were stored adjacent to the three buildings and vehicles awaiting repair lain on the fields to the north and west. Approximately 300 gallons of waste oils per month were reportedly spread on these fields for a period of ten years.

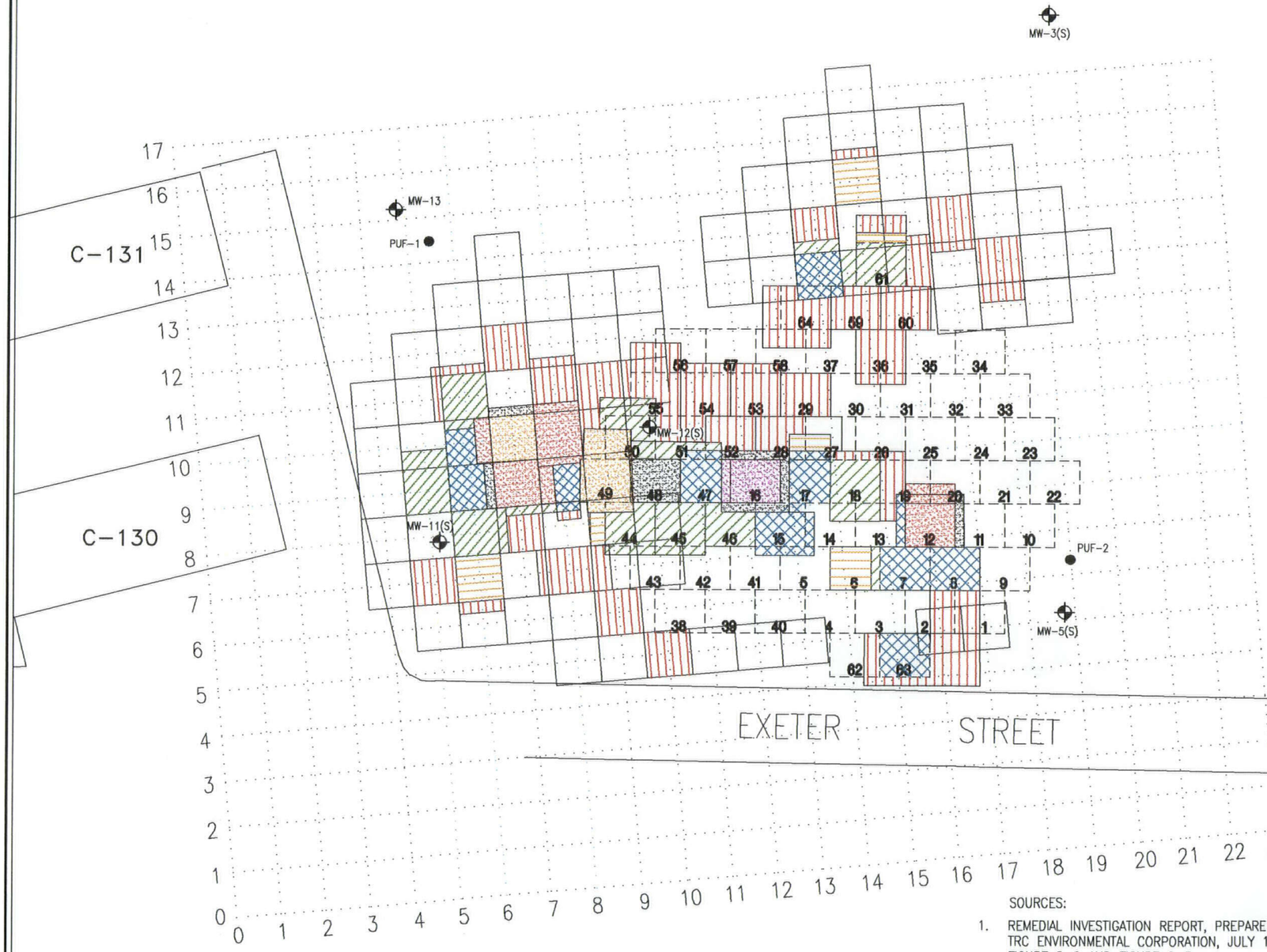
The results of TRC's Phase I and Phase II Remedial Investigation sampling programs (completed in May 1991 and July 1994, respectively) first indicated the presence of polychlorinated biphenyl (PCB) contamination in the surface soil and storm sewer catch basin sediment at Site 13. PCBs were not detected in area monitoring wells. Investigations were then conducted by Stone & Webster and Foster Wheeler to delineate the horizontal and vertical extent of PCB contaminated soil at Site 13 and, in turn, determine the limits of excavation required for the proposed time-critical removal action. Stone & Webster's sampling results were issued in the *Final Sampling Report and Recommendations for Site 13 at NCBC Davisville, RI*, dated May 22, 1996; and Foster Wheeler's immunoassay field screening results were issued in a July 26, 1996 letter report.

Foster Wheeler performed a removal action at Site 13 which involved the excavation of PCB contaminated soil. Confirmatory soil samples were collected from the excavation and analyzed to ensure that the established site cleanup criterion of 10 parts per million (ppm) PCBs has been met. In several locations, PCBs have been detected in soil which is contact with the groundwater. Groundwater monitoring at Site 13 was performed in order to ensure that removal activities of PCB contaminated soil has not mobilized PCBs in the groundwater.

1.3 Hydrogeology

The current configuration of monitoring wells at Site 13 is a result of the Phase I and Phase II Remedial Investigations (RI) conducted by TRC Environmental Corporation in 1993. The well configuration is intended to monitor groundwater conditions both upgradient and downgradient of the areas which exhibited soil contamination in the Phase I RI.

Shallow groundwater levels measured in the monitoring wells at Site 13 suggest that a groundwater divide exists near monitoring well MW03S. Groundwater flow is both northeasterly and southwesterly from this point. The locations of the existing monitoring wells allow for evaluation of potential contamination which may be originating from the Site 13 Time-Critical removal area.



LEGEND

- TRC MONITORING WELL
- TO-4 SAMPLING LOCATIONS (APPROX. LOCATIONS)
- FOSTER WHEELER SAMPLE GRID SQUARE
- 22 STONE & WEBSTER SAMPLE GRID SQUARE

EXCAVATION DEPTHS:

1 FOOT		5 FEET	
2 FEET		6 FEET	
3 FEET		7 FEET	
4 FEET		8 FEET	

0 40 80
SCALE IN FEET

SOURCES:

1. REMEDIAL INVESTIGATION REPORT, PREPARED BY TRC ENVIRONMENTAL CORPORATION, JULY 1994, FIGURE 8-2 AND FIGURE 8-3.
2. FINAL SAMPLING REPORT AND RECOMMENDATIONS FOR SITE 13 AT NCBC DAVISVILLE, R.I., PREPARED BY STONE & WEBSTER ENVIRONMENTAL TECHNOLOGY & SERVICES, MAY 22, 1996, FIGURE 3-1 AND FIGURE 4-1.
3. FIELD MEASUREMENTS TAKEN BY FOSTER WHEELER ENVIRONMENTAL CORPORATION, JULY 1996-JANUARY 1997.

FIGURE 1

NAVAL CONSTRUCTION BATTALION CENTER DAVISVILLE, RHODE ISLAND

MONITORING WELL LOCATION AND FINAL EXCAVATION CONFIGURATION MAP SITE 13

SCALE: AS SHOWN	FEBRUARY 1997

CADDFILE: 1284C011.DWG

2.0 GROUNDWATER SAMPLING PROCEDURES

Groundwater samples were collected between March 4 and 5, 1997 from five monitoring wells located within and along the perimeter of the soil excavation area at Site 13. This sampling event was the second of two groundwater sampling rounds, with the initial sampling round being conducted in December 1996. The sampling was performed to confirm that PCBs were not mobilized in the groundwater during the recent excavation of PCB contaminated soil at Site 13. Groundwater samples were collected from monitoring wells MW-3(s), MW-5(s), MW-11(s), MW-12(s), and MW13(s) during each of the sampling rounds. These monitoring wells were all screened across the shallow groundwater zone (Well construction details are summarized in Table 1).

Table 1
Well Screening Data

Well Number	Date Installed	Screen Depth (from ground surface) Top	Bottom
MW03S	10/13/89	2.50	12.50
MW05S	6/4/93	4.00	18.00
MW11S	6/9/93	4.00	14.00
MW12S	6/9/93	4.00	14.00
MW13S	6/9/93	4.00	14.00

Monitoring well purging and sampling were conducted according to the EPA's Region 1 Low Flow Purging and Sampling Procedures (USEPA 1996). The low flow procedure was used to minimize stress to the aquifer during pumping and to minimize turbidity of water samples. The approach consists of purging monitoring wells at a low flow rate, typically 0.5 liters per minute of less, then collecting groundwater samples once the field indicator parameters are stable. Monitoring wells were purged and sampled using a peristaltic sampling pump with dedicated Tygon tubing. The tubing was used only once, then discarded, therefore, decontamination of tubing was not performed. All samples submitted for analysis were unfiltered.

The following indicator parameters were measured during purging: turbidity, dissolved oxygen (DO), specific conductance, temperature, pH, and oxidation-reduction potential (ORP). All field indicator parameters, with the exceptions of turbidity and ORP were measured with a Horiba U-10 Water Quality Checker attached to a flow-through cell. ORP was measured with an Orion 250a Meter attached to the flow-through cell and turbidity was measured with a LaMotte 2008 Turbidity Meter from a sample port before the flow-through cell. Groundwater samples were collected once stability of indicator parameters was achieved over three consecutive sets of readings. Stability criteria were as follows:

Turbidity (less than 10 % variation for values greater than 1 NTU);
DO (less than 10 % variation);
Specific Conductance (less than 3 % variation);
Temperature (less than 3 % variation);
pH (less than 0.1 unit variation); and
ORP (less than 10 millivolt variation).

Stability criteria were obtained from the Region 1 Low Flow Sampling Procedure.

Once the stability criteria were met the flow through cell was disconnected and the groundwater samples were collected directly from the dedicated tubing. Field quality control samples consisted of collection of one field blank, one field duplicate sample, and one matrix spike/matrix spike duplicate sample.

3.0 RESULTS

Samples were analyzed for PCBs in strict accordance with EPA SW846 Method 8080, and for total suspended solids (TSS) in strict accordance with EPA 600 Method 160.1. All laboratory analysis were performed by MITKEM Corporation, Warwick, Rhode Island. The laboratory which was identified in the Sampling and Analysis Plan, and which performed the analysis for groundwater sampling round 1 (National Environmental Testing, Inc. (NET), Cambridge Division, of Bedford, MA) went out of business and could not be utilized for round 2. MITKEM is a Rhode Island certified laboratory.

PCBs were not detected above the laboratory detection limit any of the samples. A summary of the PCB and TSS results are included in Table 2. The results presented have not been reviewed or validated. The data has been forwarded to EA Engineering, Science, and Technology (EA) for data validation. The sample identified as DV13-GWR2-MW7S is a field duplicate of DV13-GWR2-MW12S. A copy of the full data package is included in Attachment A.

Table 2
Site 13 Analytical Data

Sample ID Date Sampled	DV13-GWR2-MW03S 3/4/97	DV13-GWR2-MW05S 3/5/97	DV13-GWR2-MW11S 3/4/97	DV13-GWR2-MW12S 3/5/97	DV13-GWR2-MW13S 3/5/97	DV13-GWR2-MW7S * 3/5/97	DV13-GWR2-FB 3/5/97
Analyte							
Aroclor 1016	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L
Aroclor 1221	0.2 U ug/L	0.2 U ug/L	0.2 U ug/L	0.2 U ug/L	0.2 U ug/L	0.2 U ug/L	0.2 U ug/L
Aroclor 1232	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L
Aroclor 1242	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L
Aroclor 1248	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L
Aroclor 1254	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L
Aroclor 1260	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L	0.1 U ug/L
TSS	4 U mg/L	4 U mg/L	4 U mg/L	4 U mg/L	5 mg/L	4 mg/L	-

* Sample DV13-GWR2-MW7S is a field duplicate of DV13-GWR2-MW12S.
"U" indicates undetected at concentration indicated.

ATTACHMENT A

Full Data Package